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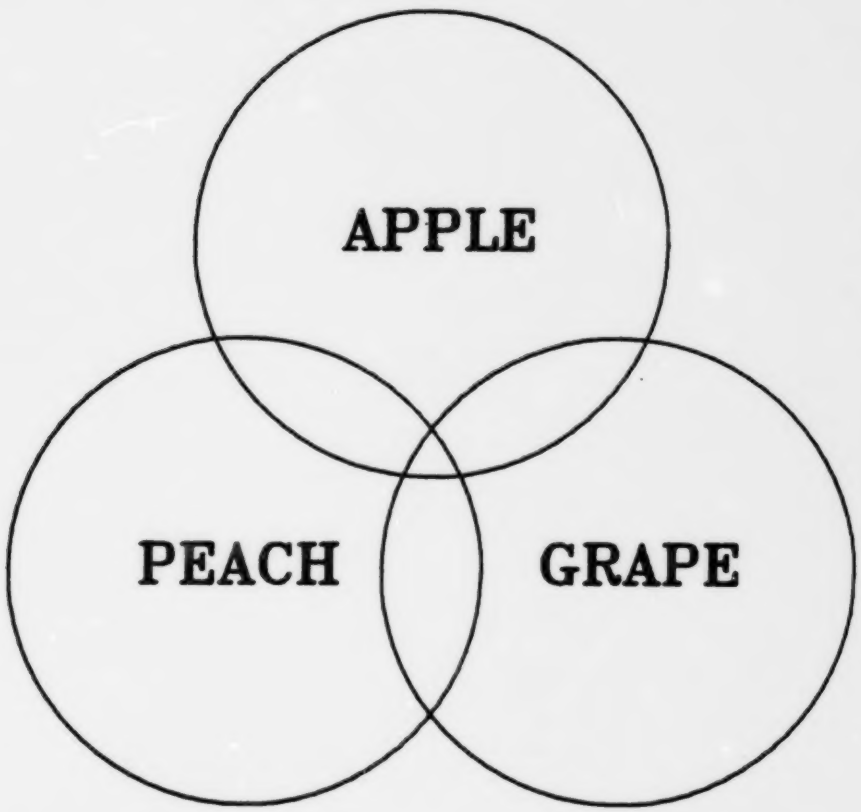

ECONOMICS AND POLICY
COORDINATION BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

ECONOMICS INFORMATION

REPORT NO. 86-06

APPLE, PEACH AND GRAPE

ESTIMATED ESTABLISHMENT COSTS

ONTARIO, 1986

Economics and Policy Coordination Branch
Ontario Ministry of Agriculture and Food
Legislative Buildings, Queen's Park
Toronto, Ontario, M7A 1B6

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch has begun to use computers in the preparation of cost data. Methods of computer simulation have now replaced the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models accurately reflect the appropriate production technology for each commodity.

Information on physical inputs is obtained from a number of sources, including:

1. Previous studies done by this Branch;
2. Surveys of the farm supply trade;
3. Technical input/output coefficients; and
4. The consensus of producers, researchers, and extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprises System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture and recently modified and rewritten by the Economics and Policy Coordination Branch to meet Ontario conditions. All 1986 cost of production estimates in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each establishment cost estimate in this report was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultations with producers, extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of establishment both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labor, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, and interest on operating capital. Fixed cost inputs are operator labor, interest on land and machinery, depreciation on machinery, taxes on real estate (net of farm tax rebate), and other overhead cost items.

LABOR HOURS AND COSTS

The required number of labor hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. The operator labor hours were valued at $6.75 per hour.

The hired labor cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance, and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etc.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, maintenance, fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 6.1 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 10.5 percent, plus one for a total of 11.5 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 36.0 cents/litre; diesel - 37.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis.

LAND CHARGES

Determining the annual cost for land use is a controversial part in any study on production costs. During the past two decades, purchasers of farmland have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the prime rate discounted for the rate of inflation, which resulted in a 6.6 percent rate.

The farm real estate taxes used for each study crop reflect the area of production and are subject to Ontario's Farm Tax Reduction Program.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the end of the fourth year of establishment. Operating capital includes the cost of materials, fuel, repairs, hired labor and other cash items. In this study, the interest rate applied to operating capital was the average prime rate of 10.5 percent plus 1 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm maintenance.

APPLE ORCHARD ESTABLISHMENT

The apple orchard under consideration is planted on semi-dwarf rootstock at a medium density of 300 trees per acre. The establishment of this orchard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the trees to grow to bearing age.

Table 1. - Apples on Size-Controlling Trees, "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Fertilizer, 15-15-15 250 kg/ha	57	23
Cover crop seed	14	6
Fumigant	455	184
Tractor and machine costs:		
Repairs and maintenance	18	7
Fuel	29	12
Custom fumigation	25	10
Interest on operating capital	258	104
TOTAL	856	346
FIXED COSTS		
Operator labor, 11.1 hours/ha	75	30
Tractor and machine costs:		
Depreciation	44	18
Interest on investment	24	9
Insurance and storage	9	4
Interest on land, $4,450/ha @ 6.6%/annum (1/2 yr.)	147	59
Taxes (1/2 year)	20	8
TOTAL	319	128
TOTAL "PREPLANT YEAR" COSTS	1,175	474

Table 2. - Apples on Size-Controlling Trees, "Preplant Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Discing	2	2.47	1.0	43.05	17.42
Cultivating	1	1.24	.5	27.23	11.02
Sowing cover crop	1	2.47	1.0	32.30	13.07
Plowing	1	2.47	1.0	51.45	20.82
Soil packing	1	2.47	1.0	45.12	18.26

Table 3. - Apples on Size-Controlling Trees, "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 87.7 hours/ha	288	116
Fertilizer, 15-15-15 250 kg/ha	57	23
Insecticides	85	34
Fungicides	166	67
Herbicides	86	35
Trees, 300 semi-dwarf	3,410	1,380
Tree guards, 300	356	144
Mouse bait, 5.6 kg/ha	9	4
Tractor and machine costs:		
Repairs and maintenance	126	51
Fuel	195	79
Equipment rental	124	50
Interest on operating capital	1,972	798
TOTAL	6,874	2,781
FIXED COSTS		
Operator labor, 85.3 hours/ha	575	233
Tractor and machine costs:		
Depreciation	261	106
Interest on investment	127	51
Insurance and storage	39	16
Interest on land, $4,450/ha @ 6.6% per annum	294	119
Taxes	39	16
Other overhead	99	40
TOTAL	1,434	581
TOTAL "PLANTING YEAR" COSTS	8,308	3,362

Table 4. - Apples on Size-Controlling Trees, "Planting Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Discing.....	2	2.47	1.0	38.75	15.68
Design and layout.....	[a]	19.8	8.0	159.24	64.44
Digging holes.....	1	24.7	10.0	501.63	203.00
Planting.....	1	59.3	24.0	324.11	131.16
Watering.....	1	9.88	4.0	176.83	71.56
Fertilizing.....	1	4.94	2.0	46.51	18.82
Weed spraying.....	2	4.94	2.0	95.88	38.80
Discing.....	3	3.71	1.5	58.07	23.50
Pesticide spraying.....	3	3.71	1.5	120.91	48.93
Summer management.....	[a]	12.4	5.0	83.40	33.75
Installing tree guards...	1	24.7	10.0	121.92	49.34
Applying mouse bait.....	1	2.47	1.0	7.78	3.15

[a]Operating performed as required.

Table 5. - Apples on Size-Controlling Trees, "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 13.6 hours/ha	59	24
Fertilizer:		
15-15-15, 250 kg/ha	57	23
Am. nitrate, 125 kg/ha	26	11
Insecticides	221	89
Fungicides	237	96
Herbicides	110	44
Trees, 15 replacements	171	69
Cover crop seed	85	34
Mouse bait, 5.6 kg/ha	9	4
Tractor and machine costs:		
Repairs and maintenance	86	35
Fuel	82	33
Interest on operating capital	328	133
TOTAL	1,471	595
FIXED COSTS		
Operator labor, 66.7 hours/ha	450	182
Tractor and machine costs:		
Depreciation	149	60
Interest on investment	82	34
Insurance and storage	31	12
Interest on land, $4,450/ha @ 6.6% per annum	294	119
Taxes	39	16
Other overhead	99	40
TOTAL	1,144	463
TOTAL "SECOND YEAR" COSTS	2,615	1,058

Table 6. - Apples on Size-Controlling Trees, "Second Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Replanting trees.....	[a]	9.88	4.0	88.76	35.92
Pruning and training.....	[a]	19.8	8.0	133.44	54.00
Fertilizing.....	2	7.41	3.0	78.80	31.89
Weed spraying.....	2	4.94	2.0	95.88	38.80
Discing.....	2	2.47	1.0	38.72	15.67
Pesticide spraying.....	5	7.41	3.0	241.90	97.89
Summer management.....	[a]	17.3	7.0	116.76	47.25
Discing and harrowing....	2	3.71	1.5	61.04	24.70
Sowing cover crop.....	1	2.47	1.0	27.97	11.32
Applying mouse bait.....	1	2.47	1.0	7.78	3.15
Spot weed control.....	[a]	2.47	1.0	47.94	19.40

[a]Operation performed as required.

Table 7. - Apples on Size-Controlling Trees, "Third Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 45.7 hours/ha	206	83
Fertilizer:		
15-15-15, 400 kg/ha	91	37
Am. nitrate, 125 kg/ha	26	11
Insecticides	221	89
Fungicides	237	96
Herbicides	58	24
Trees, 3 replacements	34	14
Mouse bait, 5.6 kg/ha	9	4
Tractor and machine costs:		
Repairs and maintenance	77	31
Fuel	57	23
Interest on operating capital	175	71
TOTAL	1,191	483
FIXED COSTS		
Operator labor, 71.7 hours/ha	484	196
Tractor and machine costs:		
Depreciation	123	50
Interest on investment	71	29
Insurance and storage	26	10
Interest on land, $4,450/ha @ 6.6% per annum	294	119
Taxes	39	16
Other overhead	99	40
TOTAL	1,136	460
TOTAL "THIRD YEAR" COSTS	2,327	943

Table 8. - Apples on Size-Controlling Trees, "Third Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Replanting trees.....	[a]	2.47	1.0	38.72	15.67
Pruning and training.....	[a]	61.8	25.0	365.11	147.75
Fertilizing.....	2	7.41	3.0	78.80	31.89
Weed spraying.....	1	2.47	1.0	47.94	19.40
Mowing.....	3	3.71	1.5	89.48	36.21
Pesticide spraying.....	5	7.41	3.0	241.90	97.89
Summer management.....	[a]	22.2	9.0	150.12	60.75
Applying mouse bait.....	1	2.47	1.0	7.78	3.15
Adjusting tree guards....	[a]	7.41	3.0	23.35	9.45

[a]Operation performed as required.

Table 9. - Apples on Size-Controlling Trees, "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 32.1 hours/ha	156	63
Fertilizer:		
Mur. of potash, 200 kg/ha	30	12
Am. nitrate, 90 kg/ha	19	8
Insecticides	276	112
Fungicides	273	110
Herbicides	100	41
Special spray	166	67
Trees, 3 replacements	34	14
Mouse bait, 5.6 kg/ha	9	4
Tractor and machine costs:		
Repairs and maintenance	111	45
Fuel	75	30
Interest on operating capital	72	29
TOTAL	1,321	535
FIXED COSTS		
Operator labor, 63.0 hours/ha	425	172
Tractor and machine costs:		
Depreciation	174	70
Interest on investment	102	41
Insurance and storage	37	15
Interest on land, $4,450/ha @ 6.6% per annum	294	119
Taxes	39	16
Other overhead	99	40
TOTAL	1,170	473
TOTAL "FOURTH YEAR" COSTS	2,491	1,008

Table 10. - Apples on Size-Controlling Trees, "Fourth Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Replanting trees	[a]	2.47	1.0	38.72	15.67
Pruning and training	[a]	49.4	20.0	290.35	117.50
Fertilizing	2	4.94	2.0	64.57	26.13
Weed spraying	2	4.94	2.0	95.88	38.80
Mowing	4	4.94	2.0	119.30	48.28
Pesticide spraying	8	11.1	4.5	362.83	146.83
Summer management	[a]	14.8	6.0	100.08	40.50
Applying mouse bait	1	2.47	1.0	7.78	3.15

Table 11. - Apples on Size-Controlling Trees, Total Costs of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
Preplanting Year	1,175	474
Planting Year	8,308	3,362
Second Year	2,615	1,058
Third Year	2,327	943
Fourth Year	2,491	1,008
TOTAL	16,916	6,845

CONCLUSIONS

The total cost of establishing this size-controlling apple orchard, estimated at $6,845 per acre, should be charged over the productive life of the orchard. If the productive life of the orchard is estimated at 20 years, the establishment cost should be amortized over the 20-year period.

Since no allowance is made for inflation over the productive cycle, an amortization rate of 6.6 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $6,845 establishment cost using a 6.6 percent rate gives an annual cost of $626 per acre for each year of the production period.

PEACH ORCHARD ESTABLISHMENT

The peach orchard under consideration is planted 145 trees per acre. The establishment of this orchard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the trees to grow to bearing age.

Table 12. - Peach "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Fumigant	455	184
Tractor and machine costs:		
Repairs and maintenance	19	8
Fuel	29	11
Custom fumigation	25	10
Interest on operating capital	227	92
TOTAL	755	305
FIXED COSTS		
Operator labor, 9.9 hours/ha	67	27
Tractor and machine costs:		
Depreciation	42	17
Interest on investment	22	9
Insurance and storage	9	4
Interest on land, $22,240/ha @ 6.6%/annum (1/2 yr.)	734	297
Taxes, 1/2 year	26	10
TOTAL	900	364
TOTAL "PREPLANT YEAR" COSTS	1,655	669

Table 13. - Peach "Preplant Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Plowing	1	2.47	1.0	51.45	20.82
Discing	2	2.47	1.0	43.05	17.42
Rotovating	1	2.47	1.0	47.69	19.30
Soil packing	1	2.47	1.0	45.12	18.26

Table 14. - Peach "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 71.7 hours/ha	258	104
Fertilizer, 15-15-15, 100 kg/ha	23	9
Insecticides	87	35
Cover crop seed	10	4
Trees, 145	1,738	703
Tree guards, 145	172	70
Tractor and machine costs:		
Repairs and maintenance	75	30
Fuel	116	47
Equipment rental	124	50
Interest on operating capital	1,047	424
TOTAL	3,650	1,476
FIXED COSTS		
Operator labor, 35.8 hours/ha	242	98
Tractor and machine costs:		
Depreciation	162	66
Interest on investment	84	34
Insurance and storage	30	12
Interest on land, $22,240/ha @ 6.6% per annum	1,468	594
Taxes	52	21
Other overhead	99	40
TOTAL	2,137	865
TOTAL "PLANTING YEAR" COSTS	5,787	2,341

Table 15. - Peach "Planting Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Discing	1	2.47	1.0	38.72	15.67
Levelling	1	2.47	1.0	36.62	14.82
Pick up trees	1	4.94	2.0	85.85	34.74
Planting trees	[a]	39.5	16.0	368.19	149.00
Discing	2	2.47	1.0	38.72	15.67
Harrowing	2	2.47	1.0	37.19	15.05
Hand weeding	[a]	7.41	3.0	23.35	9.45
Pruning	[a]	17.3	7.0	116.76	47.25
Pesticide spraying	3	3.71	1.5	120.91	48.93
Sowing cover crop	1	2.47	1.0	27.97	11.32
Installing tree guards	[a]	12.4	5.0	60.96	24.67
Mowing	4	4.94	2.0	119.30	48.28
General maintenance	[a]	4.94	2.0	15.57	6.30

[a]Operation performed as required.

Table 16. - Peach "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 11.1 hours/ha	56	22
Fertilizer, 15-15-15, 100 kg/ha	23	9
Insecticides	68	27
Fungicides	34	14
Herbicides	42	17
Cover crop seed	10	4
Trees, 10 replacements	59	24
Tractor and machine costs:		
Repairs and maintenance	61	25
Fuel	50	20
Interest on operating capital	116	47
TOTAL	519	209
FIXED COSTS		
Operator labor, 34.6 hours/ha	234	94
Tractor and machire costs:		
Depreciation ..	105	43
Interest on investment	60	24
Insurance and storage	22	9
Interest on land, $22,240/ha @ 6.6% per annum	1,468	594
Taxes	52	21
Other overhead	99	40
TOTAL	2,040	825
TOTAL "SECOND YEAR" COSTS	2,559	1,034

Table 17. - Peach "Second Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Replanting trees	[a]	4.94	2.0	33.36	13.50
Pruning	[a]	17.3	7.0	116.76	47.25
Discing	4	4.94	2.0	77.44	31.34
Sowing cover crop	1	2.47	1.0	27.97	11.32
Weed spraying	1	2.47	1.0	47.94	19.40
Pesticide spraying	4	4.94	2.0	161.26	65.26
Mowing	3	3.71	1.5	89.48	36.21
General maintenance	[a]	4.94	2.0	33.36	13.50

[a]Operation performed as required.

Table 18. - Peach "Third Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 28.4 hours/ha	142	58
Fertilizer, 15-15-15, 100 kg/ha	23	9
Insecticides	331	134
Fungicides	120	49
Herbicides	42	17
Cover crop seed	10	4
Trees, 5 replacements	60	24
Tractor and machine costs:		
Repairs and maintenance	95	39
Fuel	65	26
Interest on operating capital	153	62
TOTAL	1,041	422
FIXED COSTS		
Operator labor, 32.1 hours/ha	217	88
Tractor and machine costs:		
Depreciation	149	60
Interest on investment	87	35
Insurance and storage	31	13
Interest on land, $22,240/ha @ 6.6% per annum	1,468	594
Taxes	52	21
Other overhead	99	40
TOTAL	2,103	851
TOTAL "THIRD YEAR" COSTS	3,144	1,273

Table 19. - Peach "Third Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Replanting trees	[a]	2.47	1.0	16.68	6.75
Pruning	[a]	34.6	14.0	203.25	82.25
Discing	4	4.94	2.0	77.44	31.34
Sowing cover crop	1	2.47	1.0	27.97	11.32
Weed spraying	1	2.47	1.0	47.94	19.40
Pesticide spraying	8	9.88	4.0	322.53	130.52
Mowing	3	3.71	1.5	89.48	36.21

[a]Operation performed as required.

Table 20. - Peach "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 75.4 hours/ha	313	127
Fertilizer, 15-15-15, 100 kg/ha	23	9
Insecticides	440	178
Fungicides	276	112
Herbicides	42	17
Cover crop seed	10	4
Paint and repellant	78	31
Tractor and machine costs:		
Repairs and maintenance	95	39
Fuel	65	26
Interest on operating capital	77	31
TOTAL	1,419	574
FIXED COSTS		
Operator labor, 42.0 hours/ha	284	115
Tractor and machine costs:		
Depreciation	149	60
Interest on investment	87	35
Insurance and storage	31	13
Interest on land, $22,240/ha @ 6.6% per annum	1,468	594
Taxes	52	21
Other overhead	99	40
TOTAL	2,170	878
TOTAL "FOURTH YEAR" COSTS	3,589	1,452

Table 21. - Peach "Fourth Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Pruning	[a]	59.3	24.0	348.43	141.00
Discing	4	4.94	2.0	77.44	31.34
Sowing cover crop	1	2.47	1.0	27.97	11.32
Weed spraying	1	2.47	1.0	47.94	19.40
Pesticide spraying	8	9.88	4.0	322.53	130.52
Mowing	3	3.71	1.5	89.48	36.21
Painting trees	[a]	34.6	14.0	108.98	44.10

[a]Operation performed as required.

Table 22. - Peach Total Costs of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
Preplanting Year	1,655	669
Planting Year	5,787	2,341
Second Year	2,559	1,034
Third Year	3,144	1,273
Fourth Year	3,589	1,452
TOTAL	16,734	6,769

CONCLUSIONS

The total cost of establishing this new peach orchard, estimated at $6,769 per acre, should be charged over the productive life of the orchard. If the productive life of the orchard is estimated at 15 years, the establishment cost should be amortized over the 15-year period.

Since no allowance is made for inflation over the production cycle, an amortization rate of 6.6 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $6,769 establishment cost using a 6.6 rate gives an annual cost of $725 per acre for each year of the production period.

GRAPE ESTABLISHMENT

The vineyard under consideration is planted 600 vines per acre. The establishment of this vineyard covers a 4 1/2 year period: a half year for soil preparation, one year for planting, and three years for the vines to grow to bearing age.

Table 23. - Grape "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Tractor and machine costs:		
Repairs and maintenance	19	8
Fuel	29	11
Interest on operating capital	20	8
TOTAL	68	27
FIXED COSTS		
Operator labor, 9.9 hours/ha	67	27
Tractor and machine costs:		
Depreciation	42	17
Interest on investment	22	9
Insurance and storage	9	4
Interest on land, $11,120/ha @ 6.6%/annum (1/2 yr.)	367	148
Taxes, 1/2 year	26	10
TOTAL	533	215
TOTAL "PREPLANT YEAR" COSTS	601	242

Table 24. - Grape "Preplant Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Plowing	1	2.47	1.0	51.45	20.82
Discing	2	2.47	1.0	43.05	17.42
Rotovating	1	2.47	1.0	47.69	19.30
Soil packing	1	2.47	1.0	45.12	18.26

Table 25. - Grape "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 82.8 hours/ha	391	158
Fertilizer, 15-15-15, 100 kg/ha	23	9
Fungicides	44	18
Grape vines, 600	1,334	540
Trellis materials	2,800	1,133
Cover crop seed	10	4
Tractor and machine costs:		
Repairs and maintenance	172	70
Fuel	249	101
Equipment rental	124	50
Interest on operating capital	2,072	838
TOTAL	7,219	2,921
FIXED COSTS		
Operator labor, 81.5 hours/ha	550	223
Tractor and machine costs:		
Depreciation	346	140
Interest on investment	166	67
Insurance and storage	59	24
Interest on land, $11,120/ha @ 6.6% per annum	734	297
Taxes	52	21
Other overhead	99	40
TOTAL	2,006	812
TOTAL "PLANTING YEAR" COSTS	9,225	3,733

Table 26. - Grape "Planting Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Discing	2	2.47	1.0	38.72	15.67
Levelling	1	2.47	1.0	36.62	14.82
Picking up vines and supplies	[a]	4.94	2.0	85.85	34.74
Planting	[a]	24.7	10.0	300.61	121.65
Trellis erection	[a]	89.0	36.0	1,131.47	457.88
Pesticide spraying	2	2.47	1.0	80.63	32.63
Weed control	1	4.94	2.0	90.54	36.64
Discing	2	2.47	1.0	38.72	15.67
Rotovating	2	4.94	2.0	86.74	35.10
Summer pruning & tying	[a]	24.7	10.0	132.82	53.75
Sowing cover crop	1	1.24	0.5	21.80	8.82

[a]Operation performed as required.

Table 27. - Grape "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 65.5 hours/ha	300	122
Fertilizer:		
Am. nitrate, 111 kg/ha	24	10
15-15-15, 100 kg/ha	23	9
Insecticides	32	13
Fungicides	67	27
Grape vines, 30	67	27
Trellis materials	615	249
Cover crop seed	10	4
Tractor and machine costs:		
Repairs and maintenance	61	25
Fuel	75	30
Interest on operating capital	366	148
TOTAL	1,640	664
FIXED COSTS		
Operator labor, 40.8 hours/ha	275	111
Tractor and machine costs:		
Depreciation	117	47
Interest on investment	62	25
Insurance and storage	24	10
Interest on land, $11,120/ha @ 6.6% per annum	734	297
Taxes	52	21
Other overhead	99	40
TOTAL	1,363	551
TOTAL "SECOND YEAR" COSTS	3,003	1,215

Table 28. - Grape "Second Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Replacing vines.....	[a]	7.41	3.0	37.07	15.00
Pruning.....	[a]	24.7	10.0	145.18	58.75
Tying.....	[a]	14.8	6.0	59.31	24.00
Trellis erection.....	[a]	14.8	6.0	153.23	62.01
Weed control.....	1	4.94	2.0	90.54	36.64
Discing.....	2	2.47	1.0	38.72	15.67
Rotovating.....	2	4.94	2.0	86.74	35.10
Pesticide spraying.....	3	3.71	1.5	120.91	48.93
Fertilizing.....	1	2.47	1.0	27.97	11.32
Summer pruning & tying...	[a]	24.7	10.0	132.82	53.75
Sowing cover crop.....	1	1.24	0.5	21.80	8.82

[a]Operation performed as required.

Table 29. - Grape "Third Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 64.2 hours/ha	294	119
Fertilizer:		
Mur. of potash, 420 kg/ha	63	26
15-15-15, 100 kg/ha	23	9
Insecticides	108	44
Fungicides	154	62
Herbicides	42	17
Manure, 22.4 t/ha	247	100
Grape vines, 24	53	22
Cover crop seed	10	4
Tractor and machine costs:		
Repairs and maintenance	73	30
Fuel	65	26
Interest on operating capital	195	79
TOTAL	1,327	538
FIXED COSTS		
Operator labor, 38.3 hours/ha	259	105
Tractor and machine costs:		
Depreciation	134	54
Interest on investment	78	32
Insurance and storage	30	12
Interest on land, $11,120/ha @ 6.6% per annum	734	297
Taxes	52	21
Other overhead	99	40
TOTAL	1,386	561
TOTAL "THIRD YEAR" COSTS	2,713	1,099

Table 30. - Grape "Third Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Replacing vines.....	[a]	4.94	2.0	24.71	10.00
Pruning.....	[a]	34.6	14.0	203.25	82.25
Tying.....	[a]	14.8	6.0	59.31	24.00
Fertilizing.....	1	2.47	1.0	27.97	11.32
Manuring.....	1	3.71	1.5	87.95	35.59
Weed spraying.....	1	2.47	1.0	47.94	19.40
Discing.....	2	2.47	1.0	38.72	15.67
Rotovating.....	2	4.94	2.0	86.74	35.10
Pesticide spraying.....	5	6.18	2.5	201.54	81.56
Summer pruning & tying...	[a]	24.7	10.0	132.82	53.75
Sowing cover crop.....	1	1.24	0.5	21.80	8.82

[a]Operation performed as required.

Table 31. - Grape "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 65.5 hours/ha	295	120
Fertilizer:		
Am. nitrate, 170 kg/ha	37	15
15-15-15, 100 kg/ha	23	9
Insecticides	192	78
Fungicides	235	95
Herbicides	42	17
Cover crop seed	10	4
Tractor and machine costs:		
Repairs and maintenance	76	31
Fuel	57	23
Interest on operating capital	56	22
TOTAL	1,023	414
FIXED COSTS		
Operator labor, 44.5 hours/ha	300	121
Tractor and machine costs:		
Depreciation	118	48
Interest on investment	67	27
Insurance and storage	25	10
Interest on land, $11,120/ha @ 6.6% per annum	734	297
Taxes	52	21
Other overhead	99	40
TOTAL	1,395	564
TOTAL "FOURTH YEAR" COSTS	2,418	978

Table 32. - Grape "Fourth Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Pruning	[a]	44.5	18.0	261.32	105.75
Tying	[a]	19.8	8.0	79.08	32.00
Fertilizing	1	2.47	1.0	27.97	11.32
Discing	2	2.47	1.0	38.72	15.67
Rotovating	2	4.94	2.0	86.74	35.10
Weed spraying	1	2.47	1.0	47.94	19.40
Pesticide spraying	6	7.41	3.0	241.90	97.89
Summer pruning & tying	[a]	24.7	10.0	132.82	53.75
Sowing cover crop	1	1.24	0.5	21.80	8.82

[a]Operation performed as required.

Table 33. - Grape Total Cost of Establishment, Ontario, 1986

	Cost, $	
	per hectare	per acre
Preplanting Year	601	242
Planting Year	9,225	3,733
Second Year	3,003	1,215
Third Year	2,713	1,099
Fourth Year	2,418	978
TOTAL	17,960	7,267

CONCLUSIONS

The total cost of establishing this new vineyard, estimated at $7,267 per acre, should be charged over the productive life of the grapery. If the productive life of the vineyard is estimated at 20 years, the establishment cost should be amortized over the 20-year period.

Since no allowance is made for inflation over the production cycle, an amortization rate of 6.6 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $7,267 establishment cost using a 6.6 percent rate gives an annual cost of $665 per acre for each year of the production period.